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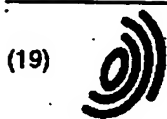
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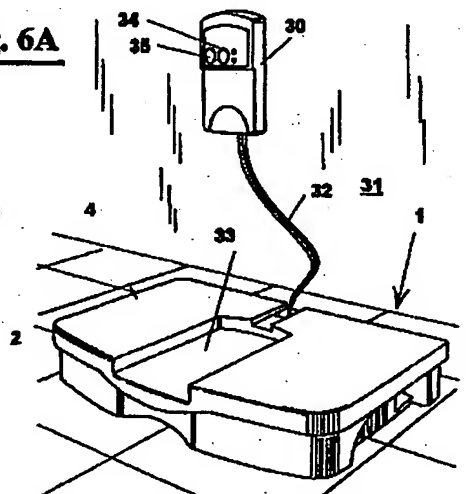
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(54) Method for signalling the presence of preys in traps for vermin and device for carrying out this method

(57) A method and a device for detection and signalling the presence of preys, which can be fixed to a trap (1) comprising a box body (2) with inlet ports (3) and a cover (4). The inlet ports 3 are equipped with a one way inlet mechanism (6,7,8). An animal that enters the trap 12, once passed a central point, causes the movement of the mechanism (6,7,8), which once passed returns back to a starting position. For signalling the presence of vermin in the trap this mechanism is used, for example by means of a push button (15) operated by the their movement. Alternatively, the means for detecting provide the use of one or a plurality of elongated elements (18) operated by the movement of the vermin in the trap. Such elements can be arranged both vertically and horizontally. A further embodiment provides a photocell or a sensor of presence arranged in the block of the trap. The means for signalling can comprise both a light device (21) and a sound device (22), arranged either on the trap or on a remote support (23). The connection can be carried out with a electrical cable (24) with a transmitter (26) and a remote receiver (25), connected to the detecting device. The means for signalling can communicate the entry of the preys in the trap with a predetermined delay time, so that other vermin that can be present enter the trap before the intervention of the operator. The device, according to the present invention can be used for monitoring several traps at the same time.

Fig. 6A



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## Description

### Field of the Invention

[0001] The present invention relates to the field of disinfecting and more precisely it relates to a signalling method for signalling the presence of preys in traps for vermin.

[0002] Furthermore the invention relates to devices that carry out this method.

### Background of the Invention

[0003] The problem of disinfecting places associated to human activities by vermin is always felt in dwellings, both in the country and in towns, as well as in factories.

[0004] Infestation from rodents, such as for example mice or rats, are frequent and annoying for dwellings, but can in particular be detrimental for companies that deal with food or other consumer goods.

[0005] In fact the regulations (UNI, ISO, EN) on safety and hygiene, to which manufacture and business concerns are bound, are strict in particular concerning the quality of the working environment.

[0006] The quality of products and services provided by concerns are verified by certification authorities, according to severe international standards, and this obliges to investments to fulfill these requirements.

[0007] Many systems are known for the elimination of small rodents, such as for example mice, which are based on a baited traps. For example the following means are known for catching or eliminating them: poisonous feed, glues that stick to the animal, snap reacting traps and box shaped traps into which rodents can enter through one way passages.

[0008] Methods that provide poisonous substances cannot be used in places where foodstuff is on sale or stored because the vermin could contaminate it before being eliminated.

[0009] Snap operating traps have the drawback that they can capture only a single animal at a time and the mechanism can easily be recognised by mice. Furthermore, they cannot be used in public places.

[0010] Box shaped traps, on the contrary, have the advantage that they can capture many vermin at the same time and are hygienic, since such vermin are substantially insulated from the outside.

[0011] A problem that limits the application of such box shaped is that the traps have to be located in places not much accessible places and must then be controlled frequently to check the presence of possible rodents captured.

[0012] In the case wherein large rooms are to be disinfested, such as for example stores or supermarkets, many traps located in hidden and dispersed places are used, whereby a frequent periodic check of all the traps is expensive and troublesome. Furthermore, to

check the presence of vermin is necessary to open the traps, and this step has to be carried out by specialised staff, owing to the possible presence possible of living noxious vermin inside. Finally, a frequent check of the traps disturbs the vermin so that they suspect entering it.

[0013] For all these reasons the need is felt of a method for signalling the presence of preys in traps for vermin, such as for example for small rodents and mice, that is practical and not expensive to use, and that allows an easy and quick monitoring of one or several traps at the same time.

### Summary of the Invention

[0014] It is an object of the present invention to provide a method for determining the presence of preys in traps used for capturing vermin, such as for example small rodents, that is practical and not expensive to use and that allows the quick monitoring of each trap or of several traps at the same time.

[0015] It is another object of the invention to provide a device used for carrying out this method.

[0016] These and other objects are achieved by the method for determining the presence of preys in traps according to the present invention, whose characteristic is of providing the steps of:

- automatic detection the presence of the preys in such traps;
- light and/or acoustic and/or remote signalling that at least a prey has been caught.

[0017] Advantageously the step of signalling can be carried out with a predetermined delay time with respect to the step of determining the presence of the preys, so that other vermin are not disturbed and attracted by the trap up to filling it before that the operator checks it directly.

[0018] The device used for carrying out this method comprises

- means for automatic detecting the presence of the preys in the traps;
- light and/or acoustic and/or remote means responsive to said means for detecting for signalling that at least a prey has been caught.

[0019] This device can be mounted advantageously to box-shaped traps that comprise at least a inlet port having, for example, a one way system comprising a tilting platform hinged on a central pin and a tilting wing hinged on a side pin. The platform is operated by vermin entering the trap and causing its progressive rotation; this movement raises the wing that in turn prevents vermin from escaping from the trap and returns the system to the starting position once the prey is in.

[0020] In a first embodiment the means for detect-

ing can comprise a push button operated by lowering at least one of the tilting elements above described.

[0021] Alternatively also the rotation at the hinge of the tilting elements can be exploited for detecting the entry of the vermin in the trap; in this case the means for detecting can comprise a switch operated by the rotation of at least one of the pins about which such wings are hinged.

[0022] A third embodiment of the means for detecting provides the use of one or a plurality of stick or string elements moved by the vermin in the trap. Such elements can be arranged both vertically and horizontally. In the first case an end is connected to the cover of the trap whereas the other is arranged hanging over the bottom, in order to be operated by the movement of the vermin. In the second case an end is connected to the edge of the trap whereas the other is positioned in the center zone, also this at a height that it is moved by the preys.

[0023] In a fourth embodiment the means for detecting can comprise a photocell or a sensor of presence arranged in the box body of the trap.

[0024] Preferably the means for signalling can comprise both a light and/or sound device, arranged either on the trap or on a remote support. In the first case the connection to the system of detection can be carried out with an electrical cable, whereas in the second, beyond the electrical cable, the use can be provided of a receiver of radio or infrared signals, transmitted by a sender connected to the detection devices.

[0025] According to another aspect of the invention, the signalling systems can communicate the entry of the preys in the trap with a predetermined delay time, so that other vermin that may be present enter the trap before that the operator checks it.

[0026] The device according to the present invention allows the monitoring of several traps at the same time providing signalling systems that can comprise a control board for displaying the presence of the preys in one or a plurality of traps.

#### Brief description of the drawings

[0027] The invention will be made clearer with the following description of an embodiment thereof, exemplifying but not limitative, with reference to attached drawings wherein:

- figure 1 shows a perspective view of a trap embodying the method for signalling the presence of preys and the device for carrying it out, according to the present invention;
- figures 2A, 2B, 2C show a cross sectional view of the operation of an inlet port of the trap of figure 1, with a diagrammatical view of a possible arrangement of the sensors for detection;
- figure 3 shows an elevational perspective side view of a inlet port of the trap of figure 1, with indication

of the possible arrangement of the sensors for detection;

- figure 4 shows a cross sectional view of the possible arrangement of the sensors for detection used for carrying out the method according to the present invention;
- figures 5A, 5B, 5C show a diagrammatical view of the possible links between the system of detection of the presence of preys and the signalling system in the method according to the present invention;
- figures 6A and 6B show the body of an embodiment of the trap according to the invention, with the unit for signalling separable from the block of the trap.

#### Description of a preferred embodiment

[0028] With reference to figure 1, a trap 1 to which the method and the device for detection of preys according to the present invention can be applied, comprises a box-shaped body 2, two inlet ports 3, and a cover 4 hinged to the end on two pins 5 of which only one is shown.

[0029] With reference to figures 2A - 2C and 3, the inlet port 3 is equipped with a one way mechanism having a tilting platform 6 hinged on a central pin 7, a tilting wing 8 hinged on a side pin 9, and respective abutments 10 and 11.

[0030] In figures 2A-2C the operation of the mechanism is shown diagrammatically: an animal that enters the trap according to direction 12 of figure 2A, once passed the central pin 7, causes the rotation 13 of platform 6, raising wing 8 according to arrow 14 up to touch the abutment 11.

[0031] The animal, then, causes the platform 6 to rotate completely, as shown in figure 2C, which returns back to the starting position owing to the weight of the wing after that the animal has passed.

[0032] According to a main aspect of the present invention, for signalling the presence of vermin in the trap 1 the above mechanism is used by means of push button 15 operated, in this embodiment, by lowering tilting platform 6.

[0033] In a second embodiment for detecting the entry of the vermin in the trap the rotation can be exploited of tilting platform or of tilting wings. In this case the means for detecting comprise a switch 16 operated by the rotation of pin 7. What said is valid obviously also for wing 8 and for the corresponding pin 9. In figure 3 is shown the mounting steps of the switch 16 by means of two strips 17 that move integrally to the wing 7.

[0034] With reference to figures 4A and 4B, a third embodiment of the means for detecting provides the use of one or a plurality of elongated elements 18 operated by the movement of the vermin in the trap. Such elements can be arranged both vertically, as in the case in figure 4A, and horizontally, figure 4B.

[0035] In the first case (figure 4A) an end 18a is connected to the device 19 located on the cover of the

trap containing the means for detection, whereas the other end 18b is arranged hanging over the bottom, in order to be operated by the movement of the vermin.

[0036] In the second case (figure 4B) an end 18a is connected to the edge 20 of the trap whereas the other end is positioned in a center zone, also this at a height that it is moved by the movement of the preys.

[0037] In a further embodiment of the present invention the means for detecting can comprise a photocell or a sensor of presence arranged in the box body of the trap. This solution is not shown in the figures.

[0038] The means for signalling (figure 5A-5C) can comprise both a light device 21 and a sound device 22, arranged either on the trap (figure 5A) or on a remote support 23 (figure 5B-5C). In the second case the connection to the system of detection can be carried out with an electric cable 24, and/or with a receiver of radio or infrared signals 25, transmitted by a sender 26 connected to the detection devices.

[0039] According to another aspect of the invention the signalling systems can communicate the entry of the preys in the trap with a predetermined delay time, so that other vermin that may be present can enter the trap before the intervention of the operator.

[0040] The device, according to the present invention allows the monitoring of several traps at the same time providing a signalling system that can comprise a control board for displaying the presence of the preys in one or a plurality of traps.

[0041] Advantageously, the means for signalling are integrated in the trap in sealed housings so that they are not exposed to damage during the washing and disinfecting steps of the box.

[0042] Alternatively, the means for signalling are compact and easily removable, for making easier the washing and disinfecting steps of the box. In the embodiment of figure 6A, in this sense, a signalling unit 30 is shown that can be fixed to a wall 31. A cable 32 connects the signalling unit 30 to the trap 1 wherein the sensor of presence or switch is located. The cover 3 comprises advantageously a housing 33 in which the signalling unit may be accommodated (fig. 6B) to transport the trap or to use the trap 1 compact with the signalling unit 30.

[0043] This way when the trap is used in a hidden place, i.e. under a piece of furniture, the signalling unit 30 is fixed like in fig. 6A, whereas when the trap 1 is used in an open space, signalling unit 30 is accommodated in housing 33 like in fig. 6B and separated only when necessary.

[0044] Signalling unit 30 may comprise a keyboard for programming an electronic board (not shown). The latter may comprise integrated sound and light means 34 and 35 as well as a transmitter for sending the signal of presence of vermin in the trap to a remote console.

[0045] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying

current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

## Claims

1. Method for determining the presence of preys in traps used for capturing vermin, such as for example small rodents, characterised in that it provides the steps of:
  - automatic detecting the presence of said preys in said traps;
  - light and/or acoustic and/or remote means for signalling that at least a prey has been caught
2. Method according to claim 1, wherein said step of light and/or acoustic and/or remote signalling is carried out with a predetermined delay time with respect to said step of determining the presence of said preys.
3. Device for determining the presence of preys in traps used for capturing vermin, such as for example small rodents, characterised in that it comprises
  - means for automatic detecting the presence of said preys in said traps;
  - means for light and/or acoustic and/or remote signalling that at least a prey has been caught.
4. Device according to claim 3, wherein said traps are box shaped and comprise at least an inlet port equipped with a system that provides a tilting platform on a central pin, operated by vermin entering the traps, and a tilting wing hinged on a side pin, which in turn prevents said vermin from escaping from said trap.
5. Device according to claim 3, wherein said means for determining the presence of said preys comprise a push button or a switch operated by at least one between said tilting platform or said tilting wing.
6. Device according to claim 3, wherein said means for determining the presence of said preys comprise one or a plurality of elongated elements hanging or extending towards the center of the trap and

operated by the movement of the vermin in said trap.

7. Device according to claim 3, wherein said means for determining the presence of said preys comprise a photo-cell or a sensor of presence arranged in the box shaped body of said traps. 5
8. Device according to claim 3, wherein a means for signalling selected among: a light and/or a sound device and/or a transmitter device, arranged on said trap, connected to said means for detecting by a electrical cable. 10
9. Device according to claim 3, wherein said means for signalling comprise a timer that signals that at least a prey has been caught after a predetermined delay time. 15
10. Device according to the previous claims, wherein said means a remote control board responsive to said means for signalling is provided for displaying the presence of said preys in one or a plurality of said traps. 20

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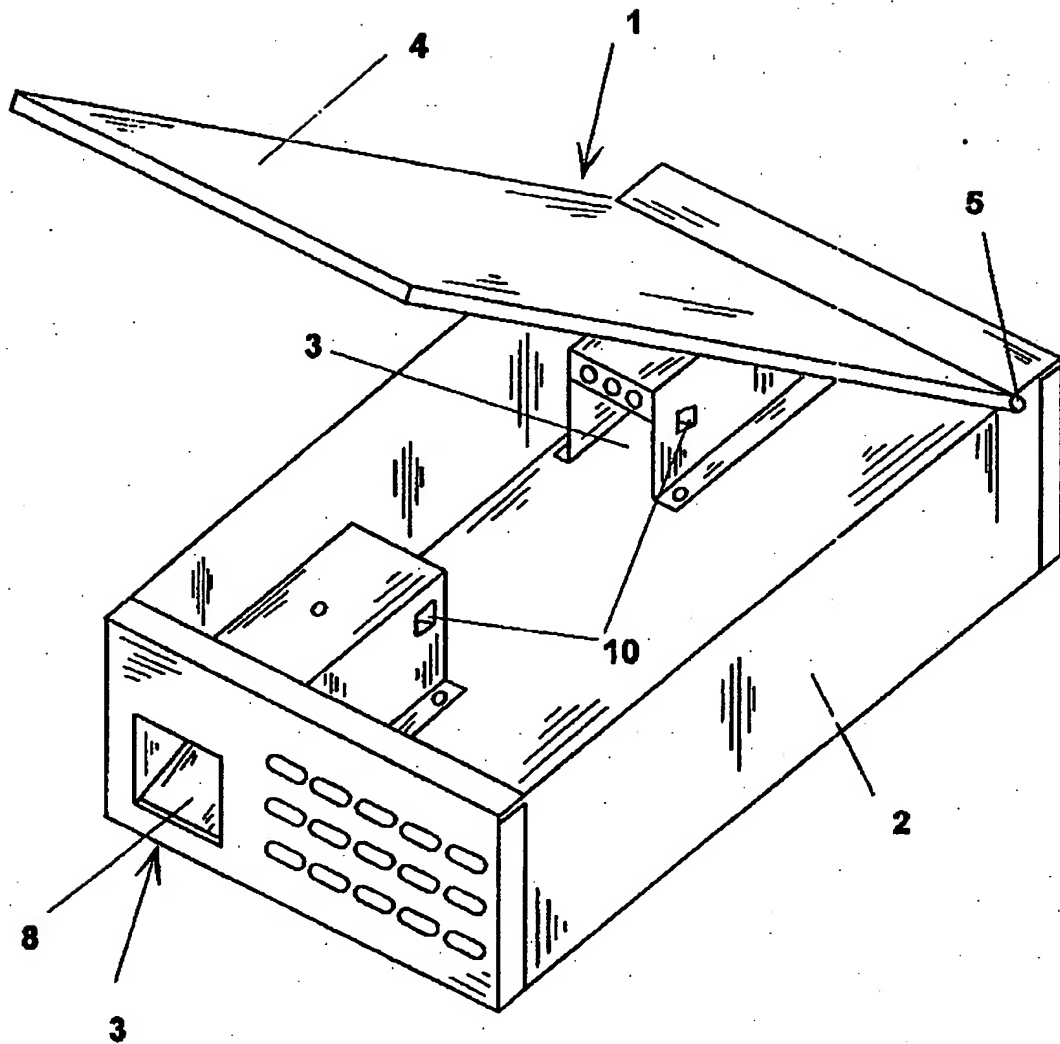
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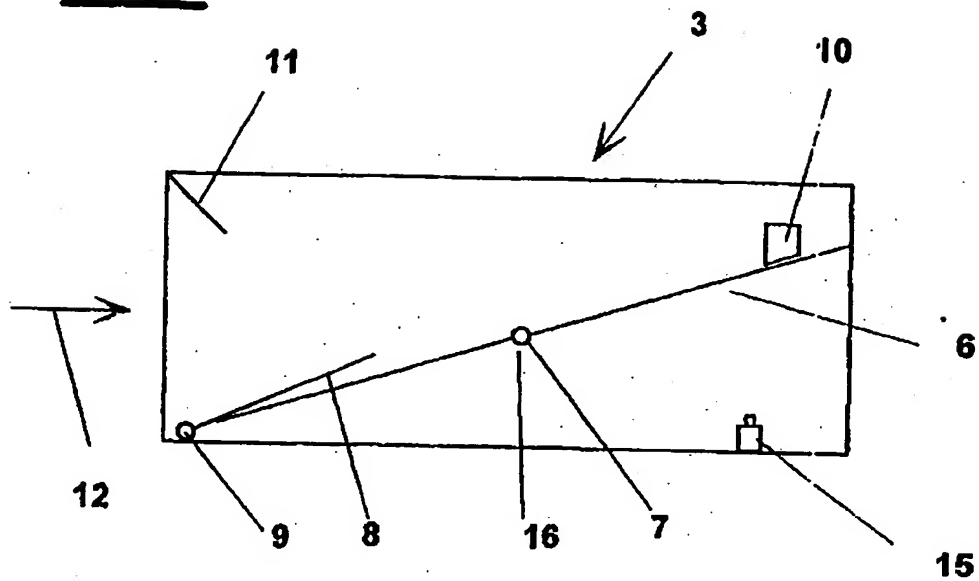
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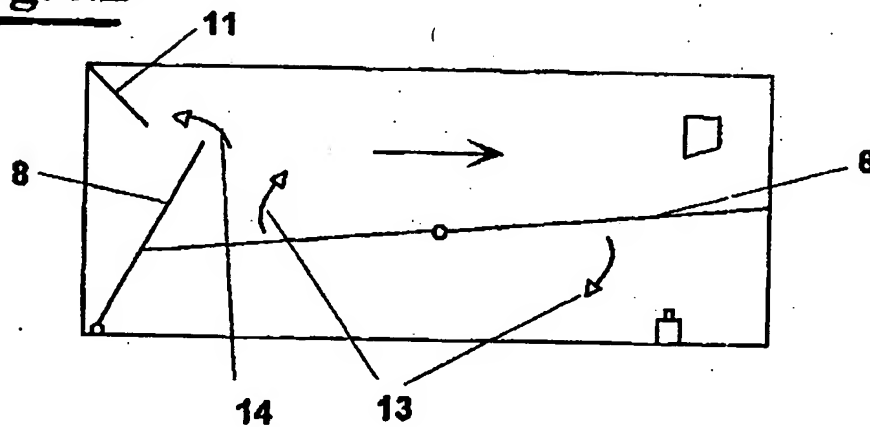
**Fig. 1**



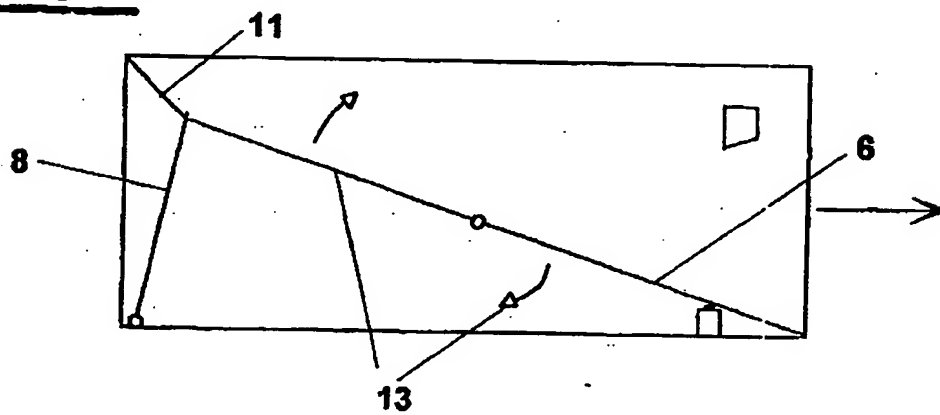
**Fig. 2A**



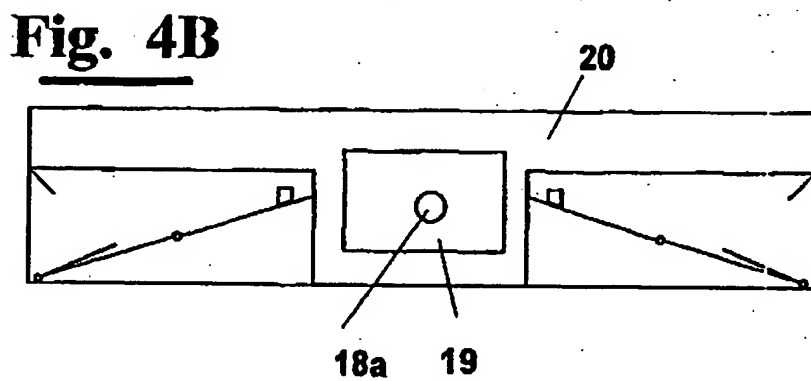
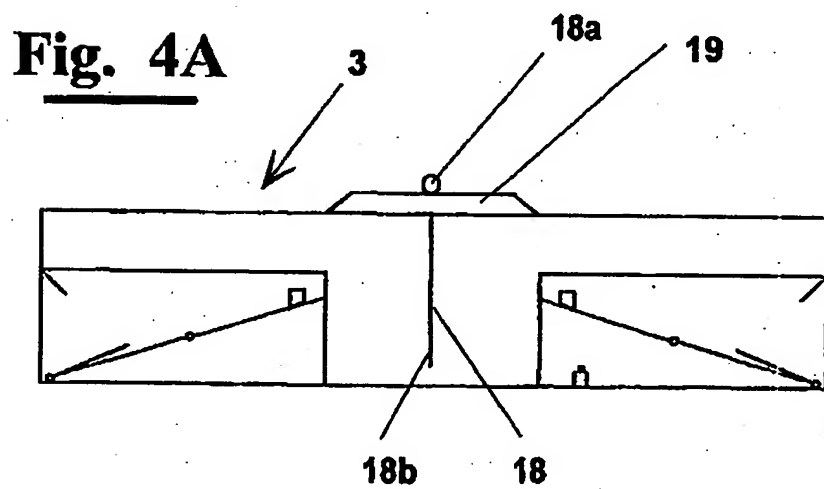
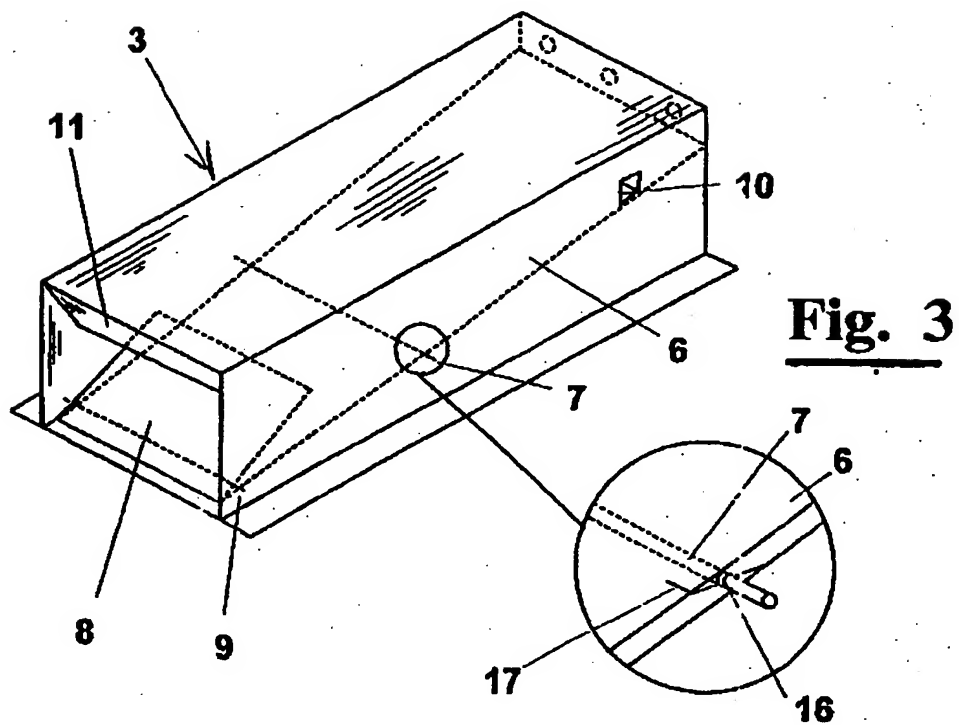
**Fig. 2B**



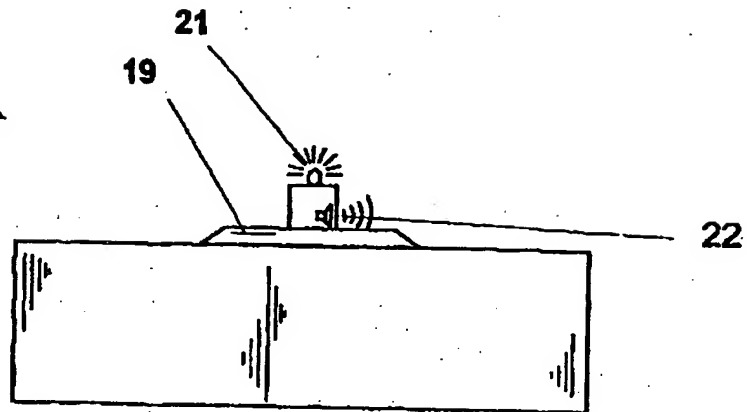
**Fig. 2C**



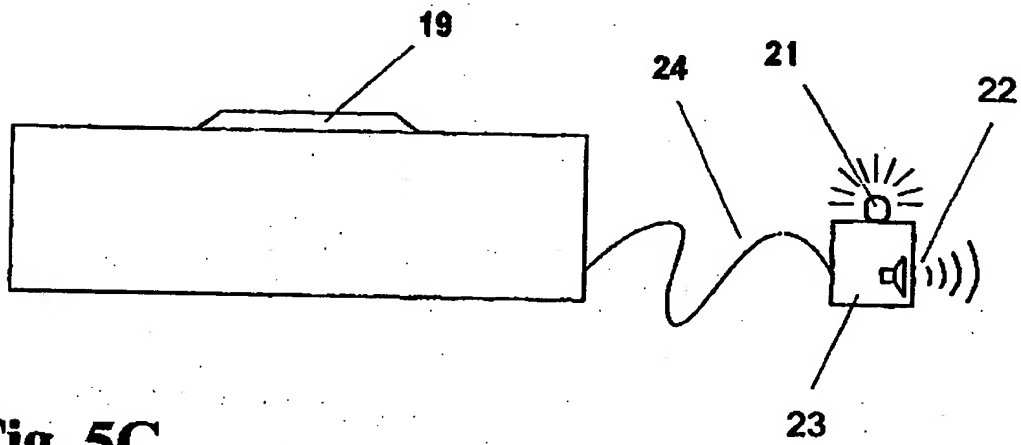




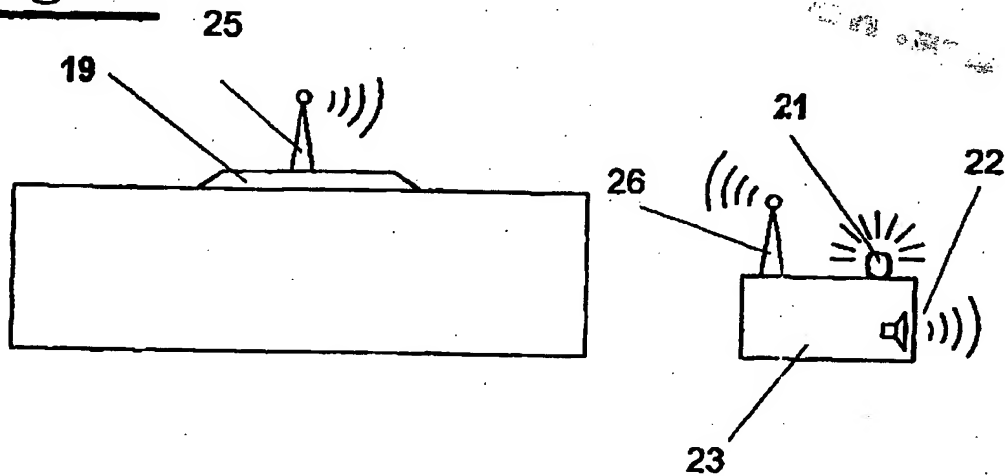
**Fig. 5A**



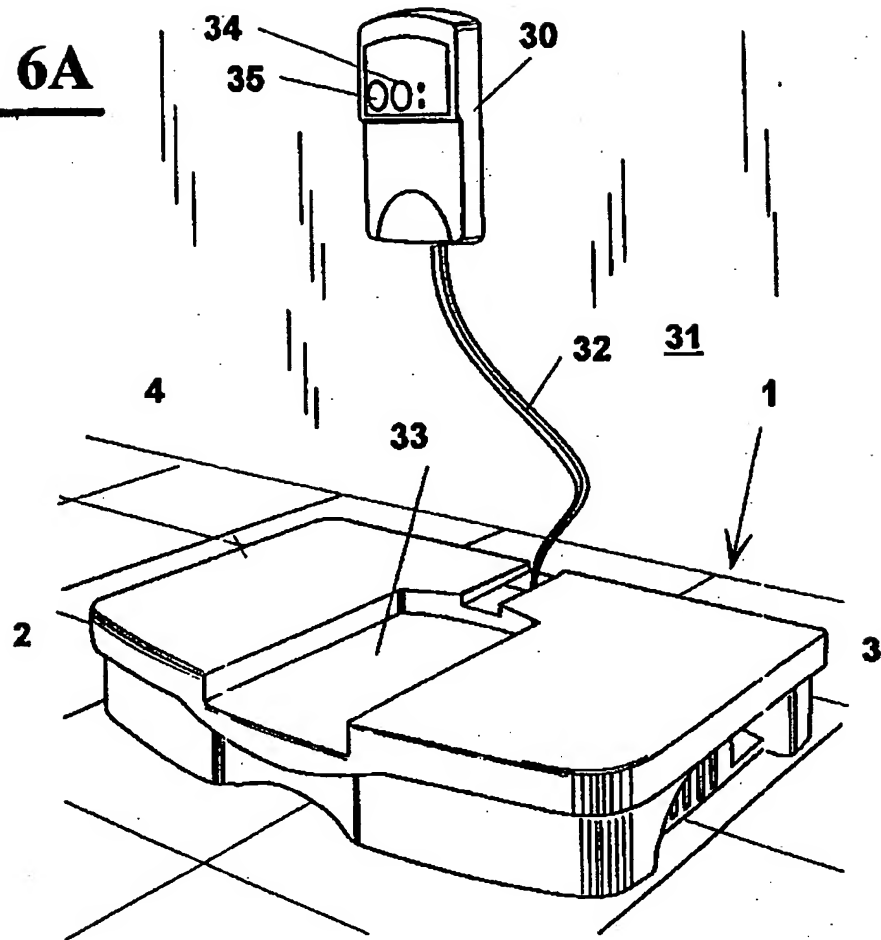
**Fig. 5B**



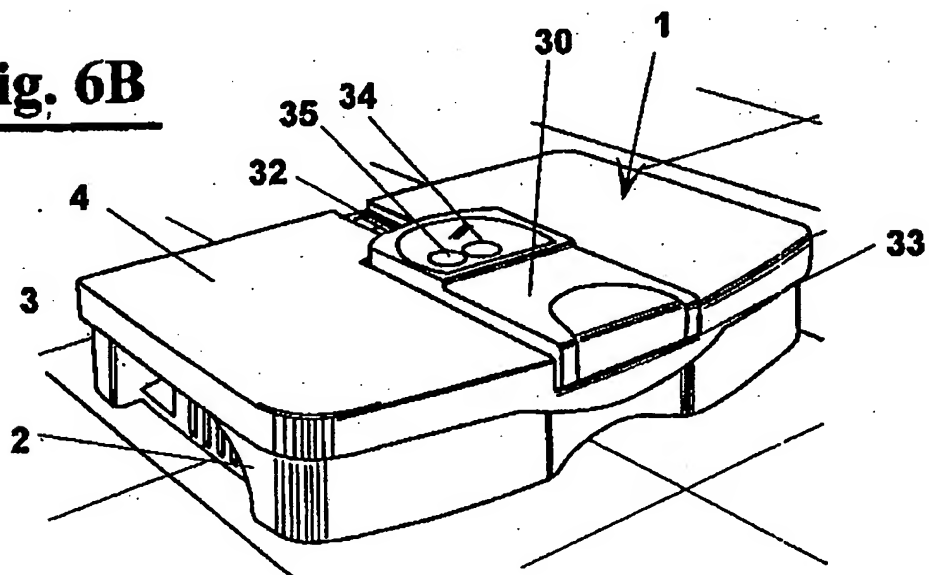
**Fig. 5C**



**Fig. 6A**



**Fig. 6B**





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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 11 2251

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 293 956 A (NELSON ROBERT LENNOX) 17 Apr 11 1996 (1996-04-17) * page 1, line 31 - page 3, line 4 * * page 4, line 27 - line 35 * * claims; figures *	1-6, 10	A01M23/00 A01M23/04
X	US 5 477 635 A (ORSANO ANTHONY) 26 December 1995 (1995-12-26) * claims; figures *	1, 3, 7, 8, 10	
X	US 5 184 416 A (BREWER DARRYL C) 9 February 1993 (1993-02-09) * claims; figures *	1, 3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A01M
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>25 August 2000</b>	Examiner <b>Piriou, J-C</b>
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US 5477635	A	26-12-1995	NONE	
US 5184416	A	09-02-1993	NONE	

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